ABSTRACT

A system for navigating a catheter probe through a body cavity includes a sensing coil affixed to a distal end of the probe. Magnetic fields are projected into the body cavity to induce voltage signals in the sensing coil that are sufficient to describe the orientation and position of the probe. A set of magnetic coils each generates a substantially uniform field in a single respective dimension. The orientation angles of the sensing coil may be determined from known values of the unidirectional fields and the measured induced voltage signals. Gradient magnetic fields with components in two dimensions are projected into the body cavity to induce another group of voltage signals. The geometrical intersection of constant voltage surfaces developed by certain gradient fields that produce the measured induced voltage signals is a set of lines on which the catheter is located. The point of intersection of such lines yields the positional coordinates.